Appl. No. 10/519,521 Amdt. dated April 9, 2007 Reply to Office Action of 01/16/2007 Attorney Docket No. 1455-045724

#### Amendments to the Specification:

### Please replace the paragraph beginning at page 2, line 7, with the following rewritten paragraph:

-- In the meanwhile, in alloys of Fe-Si, since higher silicon contents allow hysterisis hysteresis loss, magnetostriction, eeersive coercive force, and magnetic anisotropy among core loss properties to decrease and maximum permeability to increase, it is said that high silicon steel products are superior soft magnetic material. Then, the decrease of magnetostriction and the increase of maximum permeability do not continue limitlessly according to the increase of silicon content but show maximum values in 6.5% Si steel. Also, it is well known that magnetic properties of 6.5% Si steel reach the maximum state in high frequency band as well as commercial frequency band. Due to the superior magnetic properties in high frequency band, high silicon steel is mainly applicable to high frequency reactor for gas turbine generator, tank power supply, induction heating device, uninterruptible power supply or the like, and high frequency transformer for plating power supply, welding machine, X-ray power supply or the like, and is being used as substitution material of silicon grain-oriented steel. In addition, the high silicon steel is applicable for use to reduce power consumption of a motor and improve the efficiency of the motor. --

## Please replace the paragraph beginning at page 6, line 20, with the following rewritten paragraph:

-- The manufacturing processes of grain-oriented electrical steel sheet differ somewhat according to manufacturers. However, each of the processes generally includes the steps of: adjusting the contents of components in the steel making process; producing a casting slab; reheating the casting slab; hot rolling the reheated casting slab; annealing the hot-rolled hot-rolled sheet and cold rolling the hot-rolled steel sheet so as to adjust the thickness of the steel sheet; decarburization annealing the cold-rolled steel sheet; high temperature annealing the steel sheet for a secondary recrystallization; and finish coating an insulating film on the steel sheet. The above process is based on mass production. In the mass production, it is an important factor to establish a production facility toward the cold rolling. Then, as aforementioned, higher silicon content in the electrical steel sheet decreases core loss, magnetostriction, coersive coercive force, and magnetic anisotropy but increases maximum permeability, thereby demonstrating excellent magnetic properties. However, since the elongation that is a kind of mechanical properties abruptly decreases

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Appl. No. 10/519,521 Amdt. dated April 9, 2007 Reply to Office Action of 01/16/2007 Attorney Docket No. 1455-045724

depending on an increase in silicon content, it is known that up to 3.3% Si is contained in a starting material to which the cold rolling enabling the mass production of electrical steel is applicable. --

## Please replace the paragraph beginning at page 7, line 20, with the following rewritten paragraph:

-- Accordingly, the <u>inventor has inventors have</u> researched processes for manufacturing high silicon electrical steel sheets by using a conventional electrical steel sheet manufacturing process employing the cold rolling, which enables mass production. As a result, the <u>inventor has inventors have</u> found that a grain-oriented electrical steel sheet with excellent magnetic properties can be manufactured by a process comprising the steps of: preparing slurry formed by dispersing a powder coating agent being made by mixing a sintered powder of Fe-Si group having a predetermined grain size and Si content with MgO powder as the annealing separator; coating the prepared slurry on a surface of a decarburized and nitrogen-annealed electrical steel sheet; diffusion annealing the resultant steel sheet during the high temperature annealing process to complete a high silicon content and magnetic properties by a second recrystallization, and suggests the present invention. --

## Please replace the paragraph beginning at page 10, line 10, with the following rewritten paragraph:

-- To solve the above problem, the <u>inventor inventors</u> repeated <u>researches on research on the</u> diffusion principle and so forth using Si powder and Fe powder, and finally found that the defects in the diffusion reaction portion are based on faster diffusion rate of Si than Fe. --

#### Please replace the paragraph beginning at page 13, line 8, with the following rewritten paragraph:

-- When Fe-Si-based sintered powder manufactured as above is mixed with MgO powder and is used as the coating agent of electrical steel sheet. This sheet, this mixed powder is made in a slurry and coated on the surface of the steel sheet by using a roll coater, which is most economical in commercial production. The Fe-Si-based sintered powder as the siliconizing agent should be made as fine as possible. This enhances the coating workability in a commercial operator and is advantageous in terms of management of surface shape on the diffusion reaction. However, since the Fe-Si-based sintered powder where annealing reaction is completed is in a state of fused of a fused lump by a high

Appl. No. 10/519,521 Amdt. dated April 9, 2007 Reply to Office Action of 01/16/2007 Attorney Docket No. 1455-045724

temperature and long term reaction, it is necessary to control the grain size of the powder as fine as possible. --

### Please replace the paragraph beginning at page 14, line 25, with the following rewritten paragraph:

-- As aforementioned, the invention utilizes the conventional manufacturing process of a grain-oriented electrical steel sheet including the steps of: producing a steel slab; reheating the steel slab; hot rolling the reheated steel slab; annealing the hot-rolled sheet and cold rolling the anneal annealed steel sheet to adjust the thickness of the steel sheet; decarburization annealing the eled-rolled cold-rolled steel sheet; performing a high temperature annealing of the steel sheet for a secondary recrystallization; and finish coating an insulating film. However, the invention is not limited to the above concrete manufacturing process. For instance, the inventive process may omit the hot-rolled hot-rolled sheet annealing step, or can be applied to a manufacturing process of an electrical steel sheet including the nitrizing nitriding step together with the decarburization annealing. --

## Please replace the paragraph beginning at page 20, line 21, with the following rewritten paragraph:

-- Next, one of the obtained cold-rolled cold-rolled steel sheets was coated with an annealing separator formed by adding 3% TiO<sub>2</sub> powder to 100 part parts by weight of MgO corresponding to the manufacturing condition of the conventional normal product, to manufacture a grain-oriented electrical steel sheet. The remaining cold-rolled cold-rolled steel sheets were coated with powder coating agents, which were dispersed in water and made in a slurry state and have different compositions and different grain sizes as shown in table 1, by using a roller coater. After that, these steel sheets were dried at a temperature below 700 °C and coiled to obtain large-sized coils. --

# Please replace the paragraph beginning at page 25, line 6, with the following rewritten paragraph:

-- Next, siliconizing composition was formed in slurry in a slurry state by mixing 25 part parts by weight of Fe-Si-based sintered powder having a grain size of -325mesh and containing 50% Si with 100 part parts by weight of MgO and then dispersing the mixture in water. The siliconizing composition was coated on the surfaces of the obtained decarburized annealed steel sheets by a roll coater. After that, the steel sheets were dried and coiled to obtain large-sized coils. --

-4-

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